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EXAMINER
WONG, ALLEN C

ART UNIT	PAPER NUMBER
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NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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	Application No.	Applicant(s)
Office Action Summary	10/656,186	KIM ET AL.
	Examiner	Art Unit	
	Allen Wong	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>24 October 2007</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16, 18-41 and 43-52* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16, 18-41 and 43-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>08 September 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

        1.☒ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on

10/24/07 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1-16, 18-41 and 43-52 have been

considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented
> and the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 21-25, 46-50 and 52 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Ngai (6,263,023) in view of Mine (US 2002/0122481).

Regarding claim 21, Ngai discloses an apparatus for image decoding, the

apparatus comprising:

a picture header decoding unit which decodes picture header information

comprising information required to decode encoded slices of an image divided into a

plurality of regions, wherein at least one of the encoded image slices corresponds to

each region of the image (col.5, ln.27-43; Ngai discloses the use of a slice address

allocator where encoded slice data parameter information is kept and coordinated, used

for decoding image information, where slice addresses, high level symbol data that

represent encoded parameters such as size, position, structures of picture information

are utilized and tracked; thus, picture headers decoding unit is utilized; col.4, ln.28-32

and ln.45-51, Ngai discloses that plural slices, in that each slice represent a region or

section of the image frame, are decoded accordingly);

a slice construction unit which determines the structures and positions of the

encoded image slices to be decoded according to the decoded picture header

information (col.4, ln.28-32 and ln.45-51, Ngai discloses that the decoded picture slices

from slice decoders 16 are sent to the stream slicer and then the decoded data are then

sent to synchronizer 20 for preparation of assembling or constructing the plural slices

based on the obtained header data, symbols or encoded parameters, as disclosed in

col.5, ln.35-39 for determining the structure and positioning of the slices' data, for

reassembling the image frame data);

a slice decoding unit which decodes the encoded image slices according to the

decoded picture header information (col.4, ln.28-32, fig.1 elements 16 are slice

decoders for decoding slices based on the decoded header picture information as

disclosed in col.5, ln.35-39); and

an image construction unit which disposes image data of each decoded slice

according to the determined structure and position of the slices and restores and

outputs a decoded image (col.4, ln.28-32 and ln.45-51, Ngai discloses that the decoded

picture slices from slice decoders 16 are sent to the stream slicer and then the decoded

data are then sent to synchronizer 20 for preparation of reassembling or reconstructing

the plural slices into frame data based on the obtained header data, symbols or

encoded parameters, as disclosed in col.5, ln.35-39, and in col.4, ln.51-55, the

reconstructed image data of the decoded image data is outputted for display for the

desired viewing format).

Ngai does not specifically disclose wherein a plurality of the encoded image

slices corresponds to a redundantly encoded region of the image. However, Mine

teaches that there are encoded image slices that corresponds to the redundantly

encoded region of the image (paragraph 0098, Mine discloses that the importance or

redundancy of the macroblock data from slices are determined for determining whether

certain macroblock data from certain slice data corresponds to the data from "notice

region" or important data, or "not a noticed region", ie. redundant image data, and if the

macroblock data from the slice belongs to "not a noticed region" or redundantly encoded

image region, then the data is given a low importance to signify the redundantly

encoded region of the image). Therefore, it would have been obvious to one of ordinary

skill in the art to combine the teachings of Mine into the system of Ngai for efficiently

encode image data without degrading image quality (paragraph 0012).

Regarding claims 22 and 47, wherein the slice decoding unit comprises:

an entropy-decoding portion which entropy-decodes the encoded image slices

according to the position and size information of the slices decoded from the picture

header information (col.4, ln.56-62 and fig.2, element 44 is the entropy decoder); an

inverse-transform quantization portion which performs inverse-quantization of the

entropy-decoded image slices, performs inverse-transform of the inversely-quantized

image data into a temporal domain, and generates temporal/spatial predictively-

encoded image data (col.4, ln.63-65 and fig.2, element 48 is the IDCT for inversely

discrete transform the image data as inversely quantized by element 46); and an image

restoration portion which restores the image by compensating the temporal/spatial

predictively-encoded image data (col.4, ln.65 to col.5, ln.5 and fig.2, element 54 is the

adder that reconstructs and combine the image data from element 76 as outputted by

the motion compensated section 52 and the decoded difference data 72 as outputted

from element 48 to generate the temporal/spatial predictively encoded image data).

Regarding claims 23 and 48, wherein, when the decoded picture header

information for an encoded image slice indicates that the encoded imaqe slice

corresponds to encoded regions of the image (col.5, ln.27-43; Ngai discloses the use of

a slice address allocator where encoded slice data parameter information is kept and

coordinated, used for decoding image information, where slice addresses, high level

symbol data that represent encoded parameters such as size, position, structures of

picture information are utilized and tracked; thus, picture headers decoding unit is

utilized; col.4, ln.28-32 and ln.45-51, Ngai discloses that plural slices, in that each slice

represent a region or section of the image frame, are decoded accordingly), the slice

decoding unit decodes the encoded image slice (col.4, ln.28-32, fig.1 elements 16 are

slice decoders for decoding slices based on the decoded header picture information as

disclosed in col.5, ln.35-39).

Ngai do not specifically disclose redundantly-encoded regions of image data.

However, Mine teaches that there are encoded image slices that corresponds to the

redundantly encoded region of the image (paragraph 0098, Mine discloses that the

importance or redundancy of the macroblock data from slices are determined for

determining whether certain macroblock data from certain slice data corresponds to the

data from "notice region" or important data, or "not a noticed region", ie. redundant

image data, and if the macroblock data from the slice belongs to "not a noticed region"

or redundantly encoded image region, then the data is given a low importance to signify

the redundantly encoded region of the image). Therefore, it would have been obvious

to one of ordinary skill in the art to combine the teachings of Mine into the system of

Ngai for efficiently encode image data without degrading image quality (paragraph

0012).

Regarding claims 24 and 49, wherein, when errors occur in decoding an encoded

image slice, the image construction unit constructs the decoded image using the image

data decoded from another one of the plurality of encoded image slices (col.4, ln.28-32

and ln.45-51, Ngai discloses that the decoded picture slices from slice decoders 16 are

sent to the stream slicer and then the decoded data are then sent to synchronizer 20 for

preparation of reassembling or reconstructing the plural slices into frame data based on

the obtained header data, symbols or encoded parameters, as disclosed in col.5, ln.35-

39, and in col.4, ln.51-55, the reconstructed image data of the decoded image data is outputted for display for the desired viewing format).

Ngai do not specifically disclose redundantly-encoded regions of image data. However, Mine teaches that there are encoded image slices that corresponds to the redundantly encoded region of the image (paragraph 0098, Mine discloses that the importance or redundancy of the macroblock data from slices are determined for determining whether certain macroblock data from certain slice data corresponds to the data from "notice region" or important data, or "not a noticed region", ie. redundant image data, and if the macroblock data from the slice belongs to "not a noticed region" or redundantly encoded image region, then the data is given a low importance to signify the redundantly encoded region of the image). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Mine into the system of Ngai for efficiently encode image data without degrading image quality (paragraph 0012).

Regarding claims 25 and 50, wherein, when errors do not occur when decoding the plurality of encoded image slices, the image construction unit constructs the decoded image using the image data decoded from one of the encoded image slices (col.4, ln.28-32 and ln.45-51, Ngai discloses that the decoded picture slices from slice decoders 16 are sent to the stream slicer and then the decoded data are then sent to synchronizer 20 for preparation of reassembling or reconstructing the plural slices into frame data based on the obtained header data, symbols or encoded parameters, as

disclosed in col.5, ln.35-39, and in col.4, ln.51-55, the reconstructed image data of the decoded image data is outputted for display for the desired viewing format).

Ngai does not specifically disclose the redundantly-encoded region which was encoded with a smallest quantization interval. However, Mine teaches the redundantly-encoded region which was encoded with a smallest quantization interval (paragraph 0098, Mine discloses that if the macroblock data from the slice belongs to "not a noticed region" or redundantly encoded image region, then the data is given a low importance to signify the redundantly encoded region of the image, and that the quantization value is determined based on the determination of whether the image data is in the "noticed region" or "not a noticed region", and that if the data is in the "not a noticed region", then the data is quantized with the smallest quantization interval).

Regarding claim 46, Ngai discloses a method for redundant image decoding, the method comprising:

(a) decoding picture header information including information required to decode encoded slices of an image divided into a plurality of regions, wherein at least one of the encoded image slices corresponds to each region of the image (col.5, ln.27-43; Ngai discloses the use of a slice address allocator where encoded slice data parameter information is kept and coordinated, used for decoding image information, where slice addresses, high level symbol data that represent encoded parameters such as size, position, structures of picture information are utilized and tracked; thus, picture headers decoding unit is utilized; col.4, ln.28-32 and ln.45-51, Ngai discloses that plural slices, in

that each slice represent a region or section of the image frame, are decoded

accordingly);

(b) determining structures and positions of the encoded slices to be decoded

according to the decoded picture header information (col.4, ln.28-32 and ln.45-51, Ngai

discloses that the decoded picture slices from slice decoders 16 are sent to the stream

slicer and then the decoded data are then sent to synchronizer 20 for preparation of

assembling or constructing the plural slices based on the obtained header data,

symbols or encoded parameters, as disclosed in col.5, ln.35-39 for determining the

structure and positioning of the slices' data, for reassembling the image frame data);

(c) decoding the encoded image slices according to the decoded picture header

information (col.4, ln.28-32, fig.1 elements 16 are slice decoders for decoding slices

based on the decoded header picture information as disclosed in col.5, ln.35-39); and

(d) disposing image data of each decoded slice according to the structure and

position of the slices determined in (b) and restoring and outputting a decoded image

(col.4, ln.28-32 and ln.45-51, Ngai discloses that the decoded picture slices from slice

decoders 16 are sent to the stream slicer and then the decoded data are then sent to

synchronizer 20 for preparation of reassembling or reconstructing the plural slices into

frame data based on the obtained header data, symbols or encoded parameters, as

disclosed in col.5, ln.35-39, and in col.4, ln.51-55, the reconstructed image data of the

decoded image data is outputted for display for the desired viewing format).

Ngai does not specifically disclose wherein a plurality of the encoded image

slices corresponds to a redundantly encoded region of the image. However, Mine

teaches that there are encoded image slices that corresponds to the redundantly encoded region of the image (paragraph 0098, Mine discloses that the importance or redundancy of the macroblock data from slices are determined for determining whether certain macroblock data from certain slice data corresponds to the data from "notice region" or important data, or "not a noticed region", ie. redundant image data, and if the macroblock data from the slice belongs to "not a noticed region" or redundantly encoded image region, then the data is given a low importance to signify the redundantly encoded region of the image). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Mine into the system of Ngai for efficiently encode image data without degrading image quality (Mine paragraph 0012).

Regarding claim 52, Ngai discloses a computer readable medium encoded with a computer program comprising computer-executable instructions for executing the method for image decoding of claim 46 (see above analysis of claim 46 and col.3, ln.66 to col.4, ln.3 where a computer can be used to implement the image decoding). Ngai does not specifically disclose redundant image decoding. However, Mine teaches the use of redundant image decoding (paragraph 0098, Mine discloses that the importance or redundancy of the macroblock data from slices are determined for determining whether certain macroblock data from certain slice data corresponds to the data from "notice region" or important data, or "not a noticed region", ie. redundant image data, and if the macroblock data from the slice belongs to "not a noticed region" or redundantly encoded image region, then the data is given a low importance to signify the redundantly encoded region of the image). Therefore, it would have been obvious

to one of ordinary skill in the art to combine the teachings of Mine into the system of

Ngai for efficiently encode image data without degrading image quality (Mine paragraph

0012).

Claims 1-16, 18-20, 26-41, 43-45 and 51 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Borgwardt (5,949,490) and Ngai (6,263,023) in view of Mine

(US 2002/0122481).

Regarding claims 1, 26 and 51, Borgwardt discloses a computer readable

medium encoded with a computer program comprising computer-executable

instructions for executing the method of image encoding, a method and an apparatus

for image encoding, the apparatus comprising:

a slice modeling unit which divides image data of an image into a plurality of

regions and determines a structure for each of a plurality of slices to be used in

encoding the regions of the image (col.4, ln.12-23, Borgwardt discloses that the slices

are modeled and sent to client processors for analysis to determine the structure of

slices to be used in encoding the sections or regions of the image, whereby a slice can

be considered a section or region of the image, col.4, ln.24-37, the plural slices are

encoded until all of the slices are encoded, and that when each slice is completely

encoded, the statistics are obtained to determine the structure of the slices of a picture

in a group of pictures GOP; col.4, ln.53-57); and

a slice allocation unit which allocates each region of the image to at least one of

the slices according to the slice structures, wherein the slice allocation unit allocates

each of the regions to more than one of the slices (col.4, ln.2-12 and in fig.6, Borgwardt

discloses the plural slice of each region of the frame is allocated based on the

complexity and to determine the proper encoding rate; col.4, ln.12-23, Borgwardt

discloses that the slices are modeled and sent to client processors for analysis to

determine the structure of slices to be used in encoding the sections or regions of the

image, whereby a slice can be considered a section or region of the image, and that a

target encoding rate is determined for determining the allocation of bits for encoding

each slice from a plural slices).

Borgwardt does not specifically disclose a picture header encoding unit which

encodes picture header information comprising information required to decode encoded

slices of the image. However, Ngai teaches a picture header decoding unit which

decodes picture header information comprising information required to decode encoded

slices of an image divided into a plurality of regions, wherein at least one of the encoded

image slices corresponds to each region of the image (col.5, ln.27-43; Ngai discloses

the use of a slice address allocator where encoded slice data parameter information is

kept and coordinated, used for decoding image information, where slice addresses, high

level symbol data that represent encoded parameters such as size, position, structures

of picture information are utilized and tracked; thus, picture headers decoding unit is

utilized; col.4, ln.28-32 and ln.45-51, Ngai discloses that plural slices, in that each slice

represent a region or section of the image frame, are decoded accordingly). The use of

a picture header encoding unit is well known in the art of MPEG encoding since a

picture is defined as a plurality of slices, where headers are typically used to define

picture information data for informing the decoder or the reception terminal as to how to

properly decode image data for viewing. Therefore, it would have been obvious to one

of ordinary skill in the art to combine the teachings of Borgwardt and Ngai, as a whole,

for producing an accurate, efficient, robust image decoder for producing high quality

video images for viewing (Ngai col.3, ln.13-22).

Borgwardt does not specifically disclose and a slice encoding unit which encodes

the allocated image regions into encoded slices according to the picture header

information. However, Ngai teaches the use of a high definition television decoder that

decodes the plurality of slices and generating picture information (col.5, ln.27-43; Ngai

discloses the use of a slice address allocator where encoded slice data parameter

information is kept and coordinated, used for decoding image information, and see fig.1,

note multiple slice decoders 16, thus, picture headers encoding unit is utilized). The

use of a slice encoding unit is well known in the art of MPEG encoding since a picture is

defined as a plurality of slices, wherein the use of decoders must have encoders for

encoding picture information data so as to informing the decoder or the reception

terminal as to how to properly decode image data for viewing for outputting video image

data. Therefore, it would have been obvious to one of ordinary skill in the art to

combine the teachings of Borgwardt and Ngai, as a whole, for producing an accurate,

efficient, robust image decoder for producing high quality video images for viewing

(Ngai col.3, ln.13-22).

Borgwardt and Ngai do not specifically disclose determines which of the regions

are to be redundantly encoded, and "redundantly encoded". However, Mine teaches

that there are encoded image slices that corresponds to the redundantly encoded

region of the image (paragraph 0098, Mine discloses that the importance or redundancy

of the macroblock data from slices are determined for determining whether certain

macroblock data from certain slice data corresponds to the data from "notice region" or

important data, or "not a noticed region", ie. redundant image data, and if the

macroblock data from the slice belongs to "not a noticed region" or redundantly encoded

image region, then the data is given a low importance to signify the redundantly

encoded region of the image). Therefore, it would have been obvious to one of ordinary

skill in the art to combine the teachings of Mine into the combination of Borgwardt and

Ngai, as a whole, for efficiently encode image data without degrading image quality

(Mine paragraph 0012).

Regarding claims 2 and 27, Borgwardt discloses wherein the slice modeling unit

determines that each slice structure comprises a series of macroblocks (col.4, ln.12-23;

a slice is known to comprise a plurality of macroblocks, wherein Borgwardt discloses

that the slices are modeled and sent to client processors for analysis to determine the

structure of slices to be used in encoding the sections or regions of the image, whereby

a slice can be considered a section or region of the image, col.4, ln.24-37, the plural

slices are encoded until all of the slices are encoded, and that when each slice is

completely encoded, the statistics are obtained to determine the structure of the slices

of a picture in a group of pictures GOP).

Regarding claims 3 and 28, Borgwardt discloses wherein the slice modeling unit

divides the image into at least one rectangular first region and a second region and

determines the structures of the slices so that each of the first and second regions is

included in at least one independent slice (col.4, ln.12-23, Borgwardt discloses that the

slices are modeled and sent to client processors for analysis to determine the structure

of slices to be used in encoding the sections or regions of the image, whereby a slice

can be considered a section or region of the image, col.4, ln.24-37, the plural slices are

encoded until all of the slices are encoded, and that when each slice is completely

encoded, the statistics are obtained to determine the structure of the slices of a picture

in a group of pictures GOP, and that each slice is a known to be a rectangular array of a

group of macroblocks, in that each slice can be considered a section or rectangular

region).

Regarding claims 4 and 29, Borgwardt discloses wherein the slice modeling unit

determines that each slice structure comprises a set of macroblocks at certain positions

of the image (col.4, ln.12-23; a slice is known to comprise a plurality of macroblocks,

wherein Borgwardt discloses that the slices are modeled and sent to client processors

for analysis to determine the structure of slices to be used in encoding the sections or

regions of the image, whereby a slice can be considered a section or region of the

image in that each slice is defined as a group of macroblocks in that each macroblock

has a location or position within the image).

Regarding claims 5 and 30, Borgwardt and Ngai do not specifically disclose

wherein the slice modeling unit determines the structures of the slices in which the

image data will be encoded to be identical structures. However, Mine teaches that

there are encoded image slices that corresponds to the redundantly encoded region of

the image (paragraph 0098, Mine discloses that the importance or redundancy of the macroblock data from slices are determined for determining whether certain macroblock data from certain slice data corresponds to the data from "notice region" or important data, or "not a noticed region", ie. redundant image data, and if the macroblock data from the slice belongs to "not a noticed region" or redundantly encoded image region, then the data is given a low importance to signify the redundantly encoded region of the image). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Mine into the combination of Borgwardt and Ngai, as a whole, for efficiently encode image data without degrading image quality (Mine paragraph 0012).

Regarding claims 6 and 31, Borgwardt and Ngai do not specifically disclose wherein the slice modeling unit determines the structures of the slices in which the image data will be encoded to be non-identical structures. However, Mine teaches that there are encoded image slices that corresponds to the redundantly encoded region of the image (paragraph 0098, Mine discloses that the importance or redundancy of the macroblock data from slices are determined for determining whether certain macroblock data from certain slice data corresponds to the data from "notice region" or important data, or "not a noticed region", ie. redundant image data, and if the macroblock data from the slice belongs to "not a noticed region" or redundantly encoded image region, then the data is given a low importance to signify the redundantly encoded region of the image). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Mine into the combination of Borgwardt and Ngai, as a whole,

for efficiently encode image data without degrading image quality (Mine paragraph

0012).

Regarding claims 7 and 32, Borgwardt and Ngai do not specifically disclose

wherein the slice modeling unit determines the regions to be redundantly encoded

based on regions predetermined by a user as being important regions from the image.

However, Mine teaches that there are encoded image slices that corresponds to the

redundantly encoded region of the image (paragraph 0098, Mine discloses that the

importance or redundancy of the macroblock data from slices are determined for

determining whether certain macroblock data from certain slice data corresponds to the

data from "notice region" or important data, or "not a noticed region", ie. redundant

image data, and if the macroblock data from the slice belongs to "not a noticed region"

or redundantly encoded image region, then the data is given a low importance to signify

the redundantly encoded region of the image). Therefore, it would have been obvious

to one of ordinary skill in the art to combine the teachings of Mine into the combination

of Borgwardt and Ngai, as a whole, for efficiently encode image data without degrading

image quality (Mine paragraph 0012).

Regarding claims 8 and 33, Borgwardt and Ngai do not specifically disclose

wherein the slice modeling unit determines the regions to be redundantly encoded by

detecting regions where motions are actively performed, from the image. However,

Mine teaches that there are encoded image slices that corresponds to the redundantly

encoded region of the image (paragraph 0098, Mine discloses that the importance or

redundancy of the macroblock data from slices are determined for determining whether

certain macroblock data from certain slice data corresponds to the data from "notice

region" or important data, or "not a noticed region", ie. redundant image data, and if the

macroblock data from the slice belongs to "not a noticed region" or redundantly encoded

image region, then the data is given a low importance to signify the redundantly

encoded region of the image). Therefore, it would have been obvious to one of ordinary

skill in the art to combine the teachings of Mine into the combination of Borgwardt and

Ngai, as a whole, for efficiently encode image data without degrading image quality

(Mine paragraph 0012).

Regarding claims 9 and 34, Borgwardt and Ngai do not specifically disclose

wherein the slice modeling unit determines an amount of the regions to be redundantly

encoded according to an error rate and a transmission bandwidth which occur in a

transmission environment of the encoded slices, and an encoding efficiency of the slice

encoding unit. However, Mine teaches that there are encoded image slices that

corresponds to the redundantly encoded region of the image (paragraph 0098, Mine

discloses that the importance or redundancy of the macroblock data from slices are

determined for determining whether certain macroblock data from certain slice data

corresponds to the data from "notice region" or important data *where motion is

determined*, or "not a noticed region", ie. *redundant* image data, and if the macroblock

data from the slice belongs to "not a noticed region" or redundantly encoded image

region, then the data is given a low importance to signify the *redundantly* encoded

region of the image). Therefore, it would have been obvious to one of ordinary skill in

the art to combine the teachings of Mine into the combination of Borgwardt and Ngai, as

a whole, for efficiently encode image data without degrading image quality (Mine paragraph 0012).

Regarding claims 10 and 35, Borgwardt discloses wherein the slice modeling unit comprises: a slice structure modeling portion which determines the structures of the plurality of slices to be used for image encoding (col.4, ln.12-23, Borgwardt discloses that the slices are modeled and sent to client processors for analysis to determine the structure of slices to be used in encoding the sections or regions of the image, whereby a slice can be considered a section or region of the image, col.4, ln.24-37, the plural slices are encoded until all of the slices are encoded, and that when each slice is completely encoded, the statistics are obtained to determine the structure of the slices of a picture in a group of pictures GOP).

Borgwardt and Ngai do not specifically disclose a redundant encoding modeling portion which determines positions and amount of the regions to be redundantly encoded from the image using the plurality of slices. However, Mine teaches that there are encoded image slices that corresponds to the redundantly encoded region of the image (paragraph 0098, Mine discloses that the importance or redundancy of the macroblock data from slices are determined for determining whether certain macroblock data from certain slice data corresponds to the data from "notice region" or important data, or "not a noticed region", ie. redundant image data, and if the macroblock data from the slice belongs to "not a noticed region" or redundantly encoded image region, then the data is given a low importance to signify the redundantly encoded region of the image). Therefore, it would have been obvious to one of ordinary skill in the art to

combine the teachings of Mine into the combination of Borgwardt and Ngai, as a whole,

for efficiently encode image data without degrading image quality (Mine paragraph

0012).

Regarding claims 11 and 36, Borgwardt discloses wherein the slice allocation

unit determines sizes of the plurality of slices according to an amount of the regions

(col.4, ln.2-12 and in fig.6, Borgwardt discloses the plural slice of each region of the

frame is allocated based on the complexity and to determine the proper encoding rate;

col.4, ln.12-23, Borgwardt discloses that the slices are modeled and sent to client

processors for analysis to determine the structure of slices to be used in encoding the

sections or regions of the image, whereby a slice can be considered a section or region

of the image, and that a target encoding rate is determined for determining the

allocation of bits for encoding each slice from a plural slices).

Borgwardt and Ngai do not specifically disclose "redundantly encoded".

However, Mine teaches that there are encoded image slices that corresponds to the

redundantly encoded region of the image (paragraph 0098, Mine discloses that the

importance or redundancy of the macroblock data from slices are determined for

determining whether certain macroblock data from certain slice data corresponds to the

data from "notice region" or important data, or "not a noticed region", ie. redundant

image data, and if the macroblock data from the slice belongs to "not a noticed region"

or redundantly encoded image region, then the data is given a low importance to signify

the redundantly encoded region of the image). Therefore, it would have been obvious

to one of ordinary skill in the art to combine the teachings of Mine into the combination

of Borgwardt and Ngai, as a whole, for efficiently encode image data without degrading

image quality (Mine paragraph 0012).

Regarding claims 12 and 37, Borgwardt discloses wherein the slice allocation

unit allocates the image data to the plurality of slices (col.4, ln.2-12 and in fig.6,

Borgwardt discloses the plural slice of each region of the frame is allocated based on

the complexity and to determine the proper encoding rate; col.4, ln.12-23, Borgwardt

discloses that the slices are modeled and sent to client processors for analysis to

determine the structure of slices to be used in encoding the sections or regions of the

image, whereby a slice can be considered a section or region of the image, and that a

target encoding rate is determined for determining the allocation of bits for encoding

each slice from a plural slices).

Borgwardt and Ngai do not specifically disclose image data of the regions to be

redundantly encoded and image data of regions not to be redundantly encoded.

However, Mine teaches that there are encoded image slices that corresponds to the

redundantly encoded region of the image (paragraph 0098, Mine discloses that the

importance or redundancy of the macroblock data from slices are determined for

determining whether certain macroblock data from certain slice data corresponds to the

data from "notice region" or important data, or "not a noticed region", ie. redundant

image data, and if the macroblock data from the slice belongs to "not a noticed region"

or redundantly encoded image region, then the data is given a low importance to signify

the redundantly encoded region of the image). Therefore, it would have been obvious

to one of ordinary skill in the art to combine the teachings of Mine into the combination

of Borgwardt and Ngai, as a whole, for efficiently encode image data without degrading

image quality (Mine paragraph 0012).

Regarding claims 13 and 38, Borgwardt discloses wherein the slice allocation

unit allocates the image data to the plurality of slices so that at least one slice includes

image data of only a region to be encoded (col.4, ln.2-12 and in fig.6, Borgwardt

discloses the plural slice of each region of the frame is allocated based on the

complexity and to determine the proper encoding rate; col.4, ln.12-23, Borgwardt

discloses that the slices are modeled and sent to client processors for analysis to

determine the structure of slices to be used in encoding the sections or regions of the

image, whereby a slice can be considered a section or region of the image, and that a

target encoding rate is determined for determining the allocation of bits for encoding

each slice from a plural slices).

Borgwardt and Ngai do not specifically disclose region to be redundantly

encoded. However, Mine teaches that there are encoded image slices that corresponds

to the redundantly encoded region of the image (paragraph 0098, Mine discloses that

the importance or redundancy of the macroblock data from slices are determined for

determining whether certain macroblock data from certain slice data corresponds to the

data from "notice region" or important data, or "not a noticed region", ie. redundant

image data, and if the macroblock data from the slice belongs to "not a noticed region"

or redundantly encoded image region, then the data is given a low importance to signify

the redundantly encoded region of the image). Therefore, it would have been obvious

to one of ordinary skill in the art to combine the teachings of Mine into the combination

of Borgwardt and Ngai, as a whole, for efficiently encode image data without degrading

image quality (Mine paragraph 0012).

Regarding claims 14 and 39, Borgwardt does not specifically disclose wherein

the picture header encoding unit encodes the picture header information containing

structure, position, and size of each slice. However, Ngai teaches a picture header

decoding unit which decodes picture header information comprising information

required to decode encoded slices of an image divided into a plurality of regions,

wherein at least one of the encoded image slices corresponds to each region of the

image (col.5, ln.27-43; Ngai discloses the use of a slice address allocator where

encoded slice data parameter information is kept and coordinated, used for decoding

image information, where slice addresses, high level symbol data that represent

encoded parameters such as size, position, structures of picture information are utilized

and tracked; thus, picture headers decoding unit is utilized; col.4, ln.28-32 and ln.45-51,

Ngai discloses that plural slices, in that each slice represent a region or section of the

image frame, are decoded accordingly). The use of a picture header encoding unit is

well known in the art of MPEG encoding since a picture is defined as a plurality of

slices, where headers are typically used to define picture information data for informing

the decoder or the reception terminal as to how to properly decode image data for

viewing. Therefore, it would have been obvious to one of ordinary skill in the art to

combine the teachings of Borgwardt and Ngai, as a whole, for producing an accurate,

efficient, robust image decoder for producing high quality video images for viewing

(Ngai col.3, ln.13-22).

Regarding claims 15 and 40, Borgwardt does not specifically disclose wherein

the slice encoding unit comprises: a slice header encoding portion which generates for

each of the slices a slice header comprising information used to encode macroblocks of

the slice according to the picture header information; a temporal/spatial predictive

encoding portion which temporal/spatial predictively encodes the allocated image

regions into the encoded slices of the image; a transform quantization portion which

transforms the temporal/spatial predictively-encoded data slices into a frequency

domain and quantizes the data of the transformed slices; and an entropy-encoding

portion which entropy-encodes the quantized data.

However, Ngai teaches a picture header decoding unit which decodes picture

header information comprising information required to decode encoded slices of an

image divided into a plurality of regions, wherein at least one of the encoded image

slices corresponds to each region of the image (col.5, ln.27-43; Ngai discloses the use

of a slice address allocator where encoded slice data parameter information is kept and

coordinated, used for decoding image information, where slice addresses, high level

symbol data that represent encoded parameters such as size, position, structures of

picture information are utilized and tracked; thus, picture headers decoding unit is

utilized; col.4, ln.28-32 and ln.45-51, Ngai discloses that plural slices, in that each slice

represent a region or section of the image frame, are decoded accordingly), a

temporal/spatial predictive decoding section (col.4, ln.28-32, fig.1 elements 16 are slice

decoders for decoding slices based on the decoded header picture information as

disclosed in col.5, ln.35-39), a transform quantization portion (col.4, ln.63-65 and fig.2,

element 48 is the IDCT for inversely discrete transform the image data as inversely

quantized by element 46), and an entropy decoding portion (col.4, ln.56-62 and fig.2,

element 44 is the entropy decoder).

The use of a picture header encoding unit is well known in the art of MPEG

encoding since a picture is defined as a plurality of slices, where headers are typically

used to define picture information data for informing the decoder or the reception

terminal as to how to properly decode image data for viewing. The use of a slice

encoding unit, a temporal/spatial predictive encoding portion, entropy encoding,

transform-quantization portion are well known in the art of MPEG encoding since a

picture is defined as a plurality of slices, wherein the use of decoders must have

encoders for encoding picture information data so as to informing the decoder or the

reception terminal as to how to properly decode image data for viewing for outputting

video image data. Therefore, it would have been obvious to one of ordinary skill in the

art to combine the teachings of Borgwardt and Ngai, as a whole, for producing an

accurate, efficient, robust image decoder for producing high quality video images for

viewing (Ngai col.3, ln.13-22).

Regarding claims 16 and 41, Borgwardt do not specifically disclose wherein the

slice header includes flag information which indicates whether the slice to be encoded.

However, Ngai teaches a picture header decoding unit which decodes picture header

information comprising information required to decode encoded slices of an image

divided into a plurality of regions, wherein at least one of the encoded image slices

corresponds to each region of the image (col.5, ln.27-43; Ngai discloses the use of a

slice address allocator where encoded slice data parameter information is kept and

coordinated, used for decoding image information, where slice addresses, high level

symbol data that represent encoded parameters such as size, position, structures of

picture information are utilized and tracked; thus, picture headers decoding unit is

utilized; col.4, ln.28-32 and ln.45-51, Ngai discloses that plural slices, in that each slice

represent a region or section of the image frame, are decoded accordingly). The use of

a picture header encoding unit is well known in the art of MPEG encoding since a

picture is defined as a plurality of slices, where headers are typically used to define

picture information data for informing the decoder or the reception terminal as to how to

properly decode image data for viewing. Therefore, it would have been obvious to one

of ordinary skill in the art to combine the teachings of Borgwardt and Ngai, as a whole,

for producing an accurate, efficient, robust image decoder for producing high quality

video images for viewing (Ngai col.3, ln.13-22).

Borgwardt and Ngai do not specifically disclose region to be redundantly

encoded. However, Mine teaches that there are encoded image slices that corresponds

to the redundantly encoded region of the image (paragraph 0098, Mine discloses that

the importance or redundancy of the macroblock data from slices are determined for

determining whether certain macroblock data from certain slice data corresponds to the

data from "notice region" or important data, or "not a noticed region", ie. redundant

image data, and if the macroblock data from the slice belongs to "not a noticed region"

or redundantly encoded image region, then the data is given a low importance to signify

the redundantly encoded region of the image). Therefore, it would have been obvious

to one of ordinary skill in the art to combine the teachings of Mine into the combination

of Borgwardt and Ngai, as a whole, for efficiently encode image data without degrading

image quality (Mine paragraph 0012).

Regarding claims 18 and 43, Borgwardt and Ngai do not specifically disclose

wherein the slice encoding unit quantizes each of the redundantly-encoded slices at

different quantization intervals. However, Mine teaches the image data comprising

slices are quantized each of the redundantly-encoded slices at different quantization

intervals (paragraph 0098, Mine discloses that if the macroblock data from the slice

belongs to "not a noticed region" or redundantly encoded image region, then the data is

given a low importance to signify the redundantly encoded region of the image, and that

the quantization value is determined based on the determination of whether the image

data is in the "noticed region" or "not a noticed region", and that if the data is in the "not

a noticed region", then the data is quantized with the smallest quantization interval, if

the image data is in the "noticed region", that the data is quantized with higher

quantization interval, etc.). Therefore, it would have been obvious to one of ordinary

skill in the art to combine the teachings of Mine into the combination of Borgwardt and

Ngai, as a whole, for efficiently encode image data without degrading image quality

(Mine paragraph 0012).

Regarding claims 19 and 44, Borgwardt and Ngai do not specifically disclose

wherein the slice encoding unit encodes only main information containing a macroblock

header and a motion vector of the regions to be redundantly encoded in a first slice and

encodes all information of the regions to be redundantly encoded in a second slice

among two slices including the image data of the region to be redundantly encoded.

However, Mine teaches that there are encoded image slices that corresponds to the

redundantly encoded region of the image (paragraph 0098, Mine discloses that the

importance or redundancy of the macroblock data from slices are determined for

determining whether certain macroblock data from certain slice data corresponds to the

data from "notice region" or important data, or "not a noticed region", ie. redundant

image data, and if the macroblock data from the slice belongs to "not a noticed region"

or redundantly encoded image region, then the data is given a low importance to signify

the redundantly encoded region of the image, further, the macroblock data contains the

macroblock header data as suggested in paragraph 0065, and that motion vector data

is considered, as suggested in paragraph 0069, when checking to see if there is any

temporal/spatial activity within the image to be redundantly encoded). Therefore, it

would have been obvious to one of ordinary skill in the art to combine the teachings of

Mine into the combination of Borgwardt and Ngai, as a whole, for efficiently encode

image data without degrading image quality (Mine paragraph 0012).

Regarding claims 20 and 45, Borgwardt and Ngai do not specifically disclose

wherein the slice encoding unit encodes only main information containing a macroblock

header, a motion vector, and a discrete cosine (DC) coefficient contained in a discrete

cosine transform (DCT) coefficient of the regions to be redundantly encoded in a first

slice and encodes all information of the regions to be redundantly encoded in a second

slice among two slices including the image data of the regions to be redundantly

encoded. However, Mine teaches that there are encoded image slices that corresponds

to the redundantly encoded region of the image (paragraph 0098, Mine discloses that

the importance or redundancy of the macroblock data from slices are determined for

determining whether certain macroblock data from certain slice data corresponds to the

data from "notice region" or important data, or "not a noticed region", ie. redundant

image data, and if the macroblock data from the slice belongs to "not a noticed region"

or redundantly encoded image region, then the data is given a low importance to signify

the redundantly encoded region of the image, further, the macroblock data contains the

macroblock header data as suggested in paragraph 0065, and that motion vector data

is considered when checking to see if there is any temporal/spatial activity within the

image to be redundantly encoded as suggested in paragraph 0069, and that in

paragraph 0071, the discrete cosine coefficient information is considered). Therefore, it

would have been obvious to one of ordinary skill in the art to combine the teachings of

Mine into the combination of Borgwardt and Ngai, as a whole, for efficiently encode

image data without degrading image quality (Mine paragraph 0012).
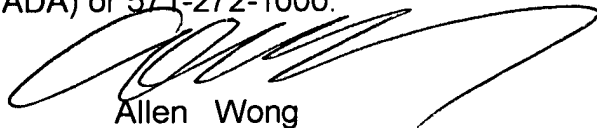
Contact Information

Any inquiry concerning this communication or earlier communications from the

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The examiner can normally be reached on Mondays to Thursdays from 8am-6pm

Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, John W. Miller can be reached on (571) 272-7353. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

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